RELIABLE VIA STRUCTURES HAVING HYDROPHOBIC INNER WALL SURFACES AND METHODS FOR MAKING THE SAME

09/715973

ABSTRACT OF THE DISCLOSURE

Disclosed is a method of making a reliable via hole in a semiconductor device layer, and a reliable via structure having internal wall surface layers that are hydrophobic, and thereby are non-moisture absorbing. The inner wall of the via structure has a layer of material having a characteristic of spin on glass (SOG), such that the characteristic is that the outer layer of the SOG oxidizes during photoresist ashing to form a surface layer of silicon dioxide in the via hole wall. In the method, the via structure is placed through a chemical dehydroxylation operation after the ashing operation, such that the layer of silicon dioxide in the via hole wall is converted into a hydrophobic material layer. The conversion is performed by introducing a halogen compound suitable for the chemical dehydroxylation operation, wherein the halogen compound may be NH_4F or CCl_4.